

IRS Human Capital: Hiring and Attrition of Employees in Compliance Occupations

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Introduction

The Federal Government's workforce is rapidly aging (Government Accounting Office (GAO), 2001). Within the Internal Revenue Service (IRS) this trend is even more pronounced for two of the IRS's mission critical jobs, Revenue Agents (RA) and Revenue Officers (RO).

Revenue Agents, Revenue Officers and Tax Compliance Officers (TCOs) make up a large proportion of the IRS compliance workforce. Revenue Officers generally work with taxpayers that are delinquent in paying their tax liability. Revenue Agents and TCOs conduct audits of previously filed tax returns to determine if tax liability was correctly reported. RA and TCO positions, while similar, differ in the complexity of work assigned to them. TCOs were examined in our original study, but they will not be discussed in this paper.

Many Revenue Agents and Revenue Officers are near retirement age. In just under five yearsⁱ, October of 2008, 45% of the currently employed RAs and ROs will be eligible for retirement. In another five years, this percentage climbs to 66%. Thus, the IRS must invest in hiring and training over the next several years in order to maintain staffing in critical areas.

In this paper, we develop a micro model of attrition for both IRS Revenue Agents and IRS Revenue Officers. We use this model to develop forecasts of the number of RAs and ROs that change jobs or leave the IRS under two different scenarios. The first scenario assumes no new employees are hired. The second scenario assumes hiring levels of RAs and ROs that maintain a constant staffing level.

Background

A significant amount of research has focused on employee turnoverⁱⁱ. Previous research has explored the relationship of wages, human capital, and demographics to the length of employee tenure in a job or organization. The model developed in this paper is consistent with the body of previous

research but does not add significantly to the understanding of worker tenure decisions. Instead, it focuses on using the model of individual tenure decisions to provide aggregate attrition forecasts of the IRS compliance workforce. Developing the forecasts in this manner provides the ability to predict attrition under almost any hiring plan.

Model and Forecast Methodology

Empirical Model

Assume that workers choose at time t to remain employed in their current job, change jobs internally or leave the IRS altogether. For the model used here, we do not distinguish between internal job transfers and leaving the Service. Thus, we assume that employees compare the net benefit between the two employment opportunities based on a set of exogenous factors x_{it-1} and a stochastic shock e_{it} . Let $e_t=0$ represent the employee choice of remaining in their current job at time t and let $e_t=1$ represent exiting their current job for employment elsewhere. An individual will choose to leave their current job if

$$E_t^* = U(e_t=1, x_{it-1}, e_{it}) - U(e_t=0, x_{it-1}, e_{it}) > 0.$$

Unfortunately, the value of E_t^* is not revealed to us. Only the sign of E_t^* is revealed by observing if the individual retains their job at time t . Assume that the net benefit from changing jobs can be represented as

$$E_t^* = x_{it-1}a + e_{it}.$$

Assuming that e_{it} is distributed normally, the decision to exit their current job can then be represented as

$$P(E_t^* > 0) = \int_{-\infty}^{x_{t-1}a} f(z) dz = \Phi(x_{t-1}a),$$

where f is the normal density function and Φ is the normal distribution function.

The standard probit model discussed above generates a probability that a given worker will leave their current job within the next year conditional on being in the job in the current year. We use the one-year transition probabilities to generate aggregate predictions of attrition over the next five years in both RA and RO occupations.

Forecast Methodology

The current year forecast of attrition rates is derived by aggregating the predicted probabilities of each employee leaving before time t , denoted as P_{it} . For $t = 2004$, expected attrition is

$$A_t = \sum_{\forall i} P_{it} \text{ for all employees in the respective job at time } t-1.$$

2004 expected attrition is based on the observed characteristics of the employees in 2003. However, to predict attrition between 2004 and 2005, we need to know the characteristics of the employees that will be in the labor pool in 2004. To accomplish this, we "aged" the current employees and recomputed all the variables derived from age and tenure. The expected number of employees exiting at time $t+1$ is then

$$A_{t+1} = \sum_{\forall i} P_{it+1} = \sum_{\forall i} (1 - P_{it}) P_{it+1}$$

for all employees in the respective job at time $t-1$. At time $t+2$ the forecasted attrition is

$$A_{t+2} = \sum_{\forall i} P_{it+2} = \sum_{\forall i} (1 - P_{it}) (1 - P_{it+1}) P_{it+2}.$$

In general, the K period ahead forecast of attrition can be expressed as

$$A_{t+K} = \sum_{\forall i} \left(\left(\prod_{k=0}^{K-1} (1 - P_{it+k}) \right) P_{it+K} \right).$$

Attrition forecasts are generated for two different scenarios. In the first, no additional employees are hired to replace those who leave. Thus, the forecast formula above is applied to the existing employees in 2003.

The second scenario consists of hiring sufficient numbers to maintain the number of employees in a given occupation at the 2003 level. To account for new employees entering the IRS labor force, we identified all new hires during the sample period. We use these individuals as a pseudo pool of potential applicants in the subsequent years. We then randomly "clone" individuals out of this pool to be the new hires in each forecast year. In this scenario, the forecast formulas are applied to the existing workforce and the "clones" that represent the new hires. One problem with this scenario is that the RA and RO occupations have had only limited hiring during the sample period. However, most of the hiring occurred in the more recent years. Thus, we feel that the past hires should be very similar to the qualified applicants that would be in future applicant pools.

Data

Our data comes from IRS payroll data. We obtained annual data from the 20th bi-weekly pay periods of each calendar year during 1997-2003. The payroll data contained an abundance of employment information. During this period, the IRS underwent a substantial reorganization that resulted in many RAs and ROs changing jobs.

In each year of our data, the total number of RAs and ROs has declined. Staffing levels for ROs and RAs are reported in Table 1. From 1997 to 2003, the total number of RAs has declined by 18.7% and ROs by 25.3%. Even in years where significant numbers of external hires were made, the additional staff has not kept up with attrition. As Figure 1 depicts, 19.7% of all current RAs and ROs will be retirement eligible by the end of 2004. This figure climbs to 61% over the next 10 years (2013).

In addition, a large cohort of employees (23% of all ROs and RAs) has 15 to 17 years of tenure. For the most part, these employees will be eligible within the next 15 years.

Table 1 - RO and RA Staffing Levels and Attrition, 1997-2003

| | Year | Employees | Quits | External Hires | Transfers out of the Job Series | Transfer into the Job Series | Percentage Change in Staffing |
|-------------------------|------|-----------|-------|----------------|---------------------------------|------------------------------|-------------------------------|
| Revenue Agents | 1997 | 15,028 | 714 | 19 | 196 | 86 | - |
| | 1998 | 14,223 | 483 | 35 | 196 | 129 | -5.36% |
| | 1999 | 13,708 | 498 | 24 | 190 | 145 | -3.62% |
| | 2000 | 13,189 | 526 | 460 | 597 | 223 | -3.79% |
| | 2001 | 12,730 | 480 | 532 | 232 | 162 | -3.48% |
| | 2002 | 12,712 | 556 | 67 | 102 | 104 | -0.14% |
| | 2003 | 12,222 | - | - | - | - | -3.85% |
| Revenue Officers | 1997 | 7,454 | 343 | 6 | 89 | 40 | - |
| | 1998 | 7,068 | 267 | 6 | 161 | 72 | -5.18% |
| | 1999 | 6,718 | 223 | 6 | 191 | 50 | -4.95% |
| | 2000 | 6,360 | 263 | 240 | 373 | 305 | -5.33% |
| | 2001 | 6,269 | 282 | 3 | 167 | 56 | -1.43% |
| | 2002 | 5,879 | 269 | 20 | 80 | 22 | -6.22% |
| | 2003 | 5,571 | - | - | - | - | -5.24% |

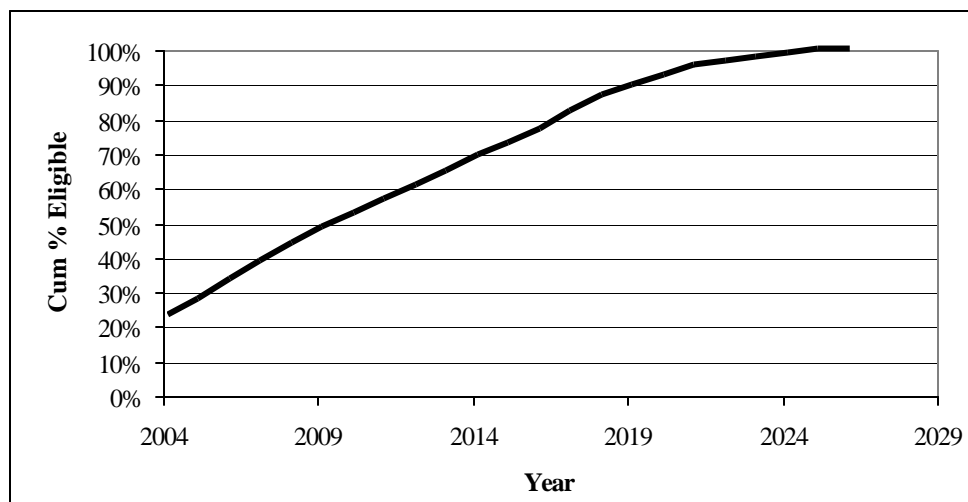
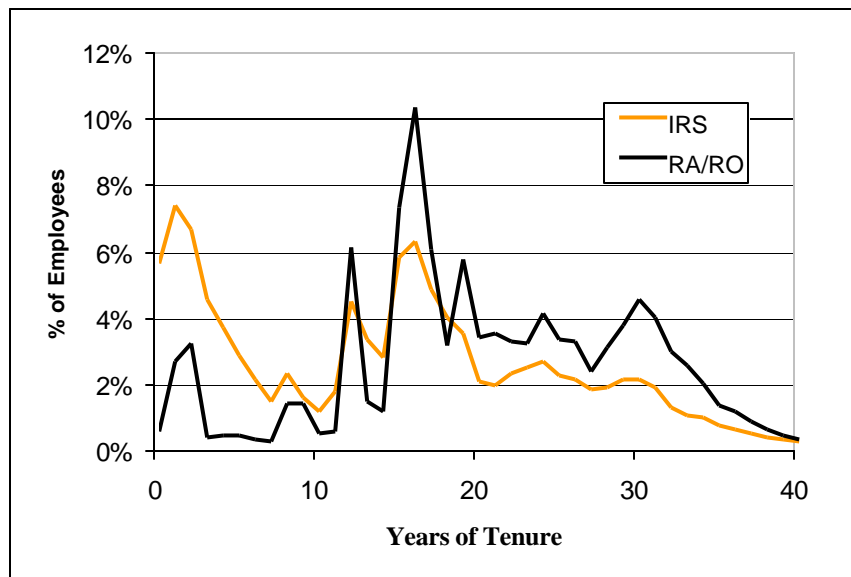


Figure 1 - Percent of the RAs and ROs Employed in 2003 that will be Eligible for Retirement

Since the early 1990s, years of tight budget conditions have limited IRS hiring. This has resulted in a void of workers at the lower end of the tenure distribution (Figure 2). In Fiscal Year (FY) 2001

and 2002, the IRS hired 992 RAs and 243 ROs from the external labor market (Table 1, calendar years 2000 and 2001). However, the average age of these new hires was 38 (Small Business and Self-Employed (SB/SE) Internal Scan) and some hires were individuals who left the service and subsequently returned. The average age suggests the IRS is not hiring recent college graduates but rather employees with significant labor market experience.



**Figure 2 - Distribution Tenure RA/RO Employees and All IRS Employees , Calendar Year 2003
(Pay Period 20)**

Excluding retirement eligible years, employee turnover in private and public sector jobs is the highest in the first years of tenure (new employees). The IRS experience has been no different. Figure 3 displays the exit rates for RAs and ROs and for the IRS overall from 1997 to 2002. In addition to the retention problems of new hires, IRS Strategic Human Resources has identified factors that are expected to complicate the retaining and replacing of experienced employees. The retention and replacement of employees will be affected by 1) a portable retirement system, 2) a growing pay gap between the public and private sectors, 3) high external competition for candidates, and 4) an emerging

pattern of frequent job changes during an employee's life span. The effects of these factors will likely be in remission until private sector jobs become plentiful again.

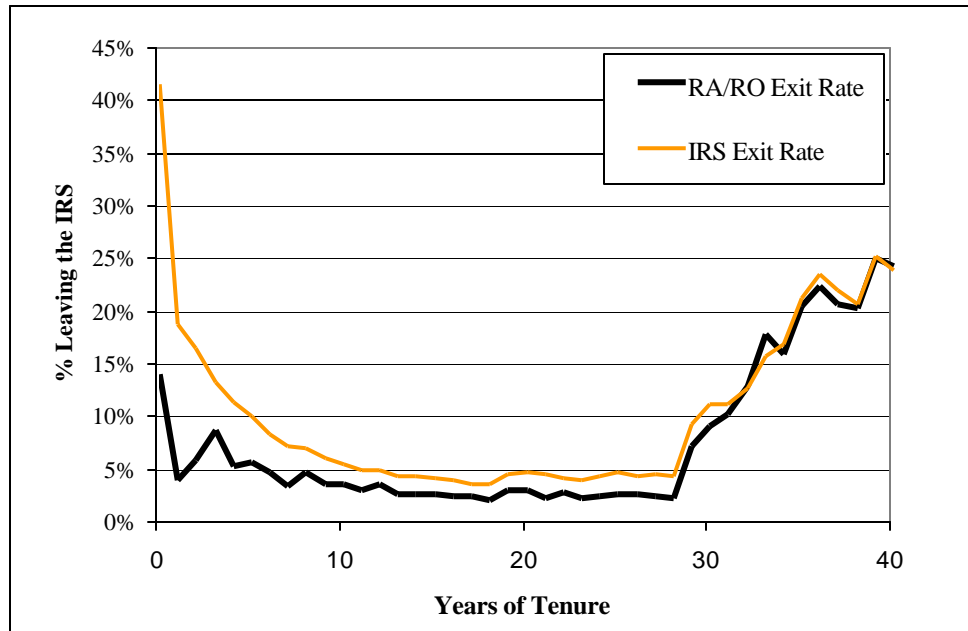


Figure 3 - RA/RO and IRS Employee Exit Rates by Years of Tenure - 1997 to 2002

The majority of federal employees are under one of two retirement systems, the Civil Service Retirement System (CSRS) and the Federal Employees Retirement System (FERS). CSRS is a traditional pension plan and FERS is comparable to a 401K plan where the employee and employer contribute. Since 1987, every new federal employee is covered in the FERS retirement system. For the most part, employees hired before 1987 are covered under the CSRS program. CSRS employees that leave before retirement eligibility stand to lose a sizable amount of their retirement savings. Given a more portable retirement system, FERS employees presumably incur lower exit costs and thus may be more inclined to exit federal service when the opportunity arises. The difference in retirement plans is utilized in creating certain retirement variables in our model. We include dummy variables for FERS employees who are eligible for early retirement, CSRS employees who are retirement eligible and at the top of their pay scale, and finally any FERS employees who have reached the top of their pay scale. In

addition, we use many variables that change with age and tenure. These include retirement eligibility, being retirement eligible for the 3rd year, becoming eligible for early retirement, and also having low tenure. Each of these variables has been “aged” when we develop forecasts.

Figure 4 displays the observed exit rates by the number of years since reaching retirement eligibility. The exit rate for retirement eligible employees is relatively more stable for the RA position. Exit rates for the RO position show more variation overall peaking after 5 years of eligibility. The exit rate appears to decline for both RA and RO employees who have been eligible for 3 years. We attempt to control for these differences in the model.

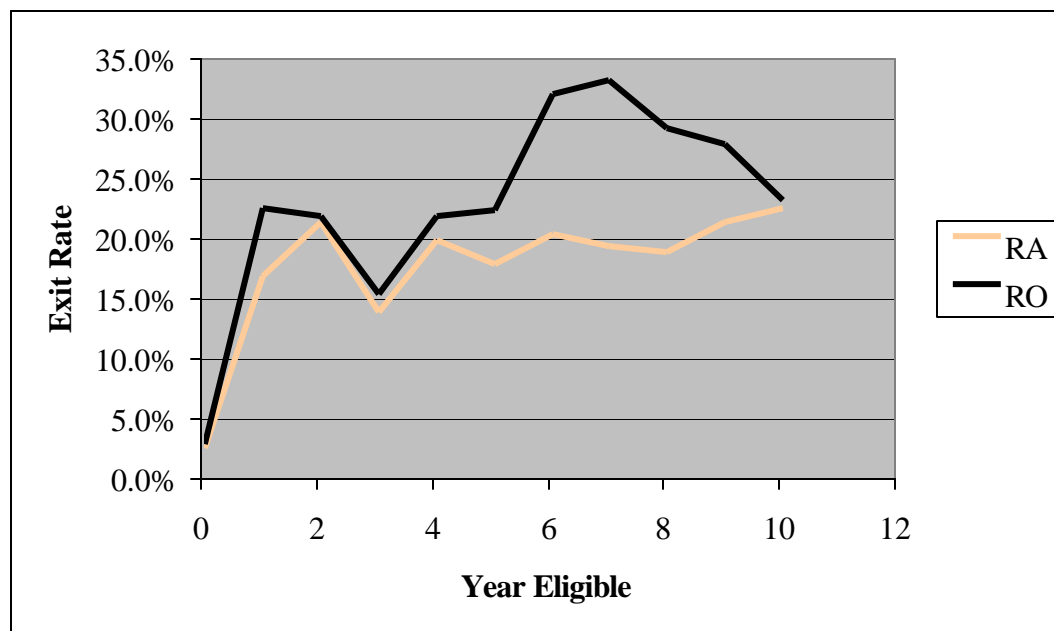


Figure 4 - Exits Rates by the Years of Being Retirement Eligible, 1998-2002

Using the yearly changes in an employee’s sick and annual leave balances enables us to control for an individuals use of leave. We control for those workers who begin hoarding annual leave (accruing annual leave in a year without using any of it) as many employees who are planning to retire

exhibit this behavior. A second dummy variable was included for those workers who have used a significant portion of their accrued sick leave.

Many factors that may affect an employee's decision to leave their job are not measured with the available data. For example, we do not have an indicator of financial standing. Wealth makes retirement more feasible, and may make workers more mobile. Generally, wealth tends to increase with age and pay, so parameter estimates associated with these variables may also include a wealth effect. Another factor is the number of dependents. Having dependents may make retirement less financially feasible, and makes workers less mobile. We include a dummy variable for family health care coverage as a proxy of family status. Unemployment rates by region could also have an effect on turnover. If unemployment is low, obtaining another job is not as difficult, so turnover should increase (and vice versa). We considered including a regional unemployment measure in the model but felt that we needed a longer sample period to obtain a defensible estimate of the effect of local labor market conditions. The IRS's reorganization would further confound our ability to measure local labor market conditions. Instead, we used annual and regional dummy variables to control for these effects.

An issue with using a micro model to develop forecasts is that it is not known how many of the individual factors may change in the future. For example, we don't know how characteristics like the hoarding of annual leave, sick leave balances, and an employee's performance evaluation may change over time. For each of these factors we used the 2003 values for the forecasted years.

Model Estimates

The probit model parameter estimates for the RA and RO models are reported in the Appendix. For the most part, these estimates are consistent with previous research. In addition, the results of the RA model are similar to the estimates for the RO model.

An interesting finding is that the overall retirement plan dummy variable (FERS) was negative and insignificant. This suggests that there is no difference in quit rates between FERS and CSRS employees who are not retirement eligible. However, the model does indicate that not using annual leave is a good indicator that employees are going to quit. Workers who receive poor performance evaluations and are not receiving awards for performance are also more likely to quit.

Forecast Scenario 1- Attrition with No Hiring

As a benchmark, we first examined the extreme case where no new employees are hired. Both the RA and RO forecasts that are reported in Table 2 suggest a modest increase in the attrition rate over time. However, the number of employees leaving each year is actually declining because we assume there is no hiring and therefore the labor force is shrinking. Between 2003 and 2004, the estimated attrition rate for RAs is 5.2% and for ROs, 6.4%. The estimated attrition rate increases through the 2007/2008 year when our estimated attrition figures are 5.7% for RAs and 7.4% for ROs. If this occurs, we expect that by 2008 the number of RAs declines by 24.3% to 9,248 employees and the number of ROs declines by 29.7% to 3,916 employees. The forecasts assume that external labor market conditions and the organizational structure will remain constant. If significant organizational change occurs, especially change that creates new internal job opportunities, one can expect that staffing would decline more rapidly.

Table 2 - Attrition Estimates with No New Hires

| Year | Revenue Agents | | Revenue Officers | |
|------|----------------|----------------|------------------|----------------|
| | Count | Attrition Rate | Count | Attrition Rate |
| 2003 | 12,222 | 5.21% | 5,571 | 6.39% |
| 2004 | 11,585 | 5.25% | 5,215 | 6.53% |
| 2005 | 10,977 | 5.40% | 4,874 | 6.75% |
| 2006 | 10,383 | 5.55% | 4,546 | 7.00% |
| 2007 | 9,808 | 5.70% | 4,227 | 7.36% |
| 2008 | 9,248 | - | 3,916 | - |

Forecast Scenario 2- *Maintaining the Status Quo*

A more interesting and relevant question is how many new ROs and RAs need to be hired to maintain staffing levels. In this scenario, every employee who leaves is back-filled with a new hire from the external labor market. Thus, we keep the number of ROs and RAs at the 2003 levels. Those workers that were hired externally between 1998 and 2003 are used to proxy the pool of potential applicants. We randomly selected from this pool, with replacement, employees to back-fill.

Table 3 displays our forecast results for both RAs and ROs. Both RA and RO attrition is forecasted to initially rise as the new hires are introduced and then eventually decline. Recall that both models include dummy variables for employees with less than two years of tenure. In the first few years of the simulated hiring, new employees account for a larger percentage of the workforce than they do in later years. As the new employees age beyond the initial two years, attrition rates start to fall.

Table 3 - Attrition Estimates: Hiring to Maintain a Constant Staffing Level

| | Revenue Agents | | Revenue Officers | |
|-------------|-----------------------|-----------------------|-------------------------|-----------------------|
| | Target Level = 12,222 | | Target Level = 5,571 | |
| Year | New Hires | Attrition Rate | New Hires | Attrition Rate |
| 2003 | 637 | 5.21% | 356 | 6.39% |
| 2004 | 653 | 5.34% | 370 | 6.65% |
| 2005 | 649 | 5.31% | 385 | 6.91% |
| 2006 | 631 | 5.16% | 379 | 6.80% |
| 2007 | 613 | 5.01% | 371 | 6.67% |

The results suggest that if all remains constant, the IRS will need to hire between 613 and 653 RAs and between 356 and 385 ROs each year over the next five years in order to maintain staffing. If

there were improvements in the external labor market or significant postings of internal jobs, we would expect the attrition numbers to be higher.

While both models include dummy variables for low tenured workers, the magnitudes of the increase are different. The RA estimate is negative, very small, and not statistically significant. The RO estimate is positive, much larger, and is significant at any reasonable level. Thus, newly hired ROs have a higher attrition rate than RAs do. One possible explanation is that ROs come from a broader background in terms of academic and labor market experience. Prior academic and labor market experience may be a much better screening device for RA applicants than for RO applicants. Thus, the RA hiring process may be more likely to produce applicants who are a good match with the job duties.

Comparing the Two Scenarios

Figure 5 and Figure 6 depict the difference in the estimates of the two scenarios. The RA estimates don't differ dramatically for the two scenarios in the initial years of the hiring. The RO model, depicted in Figure 6, shows a larger deviation, but it appears to be converging in the later years of the estimate. Both scenarios show that for ROs, increasing hires will increase employee turnover in the short-term. The difference is smaller for the RA hires. In both cases, the scenario with hiring to match attrition tends to moderate attrition rates in the long run. The moderation occurs because the hiring eventually re-populates the segments of the tenure distribution that have low quit rates.

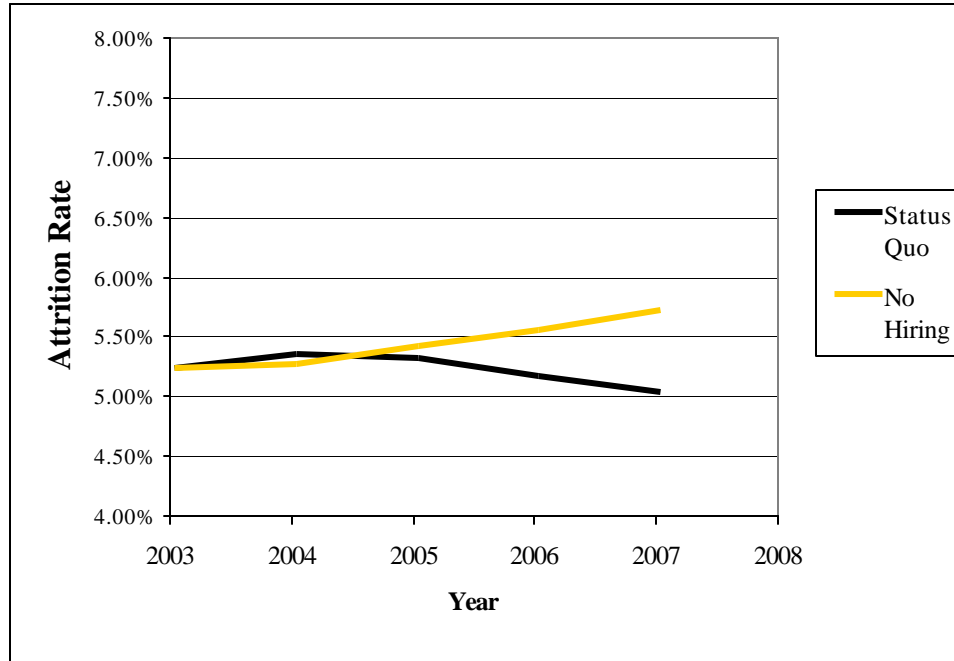


Figure 5 - Forecasted Revenue Agent Attrition Rates for the "No Hiring" and the "Status Quo" Scenarios

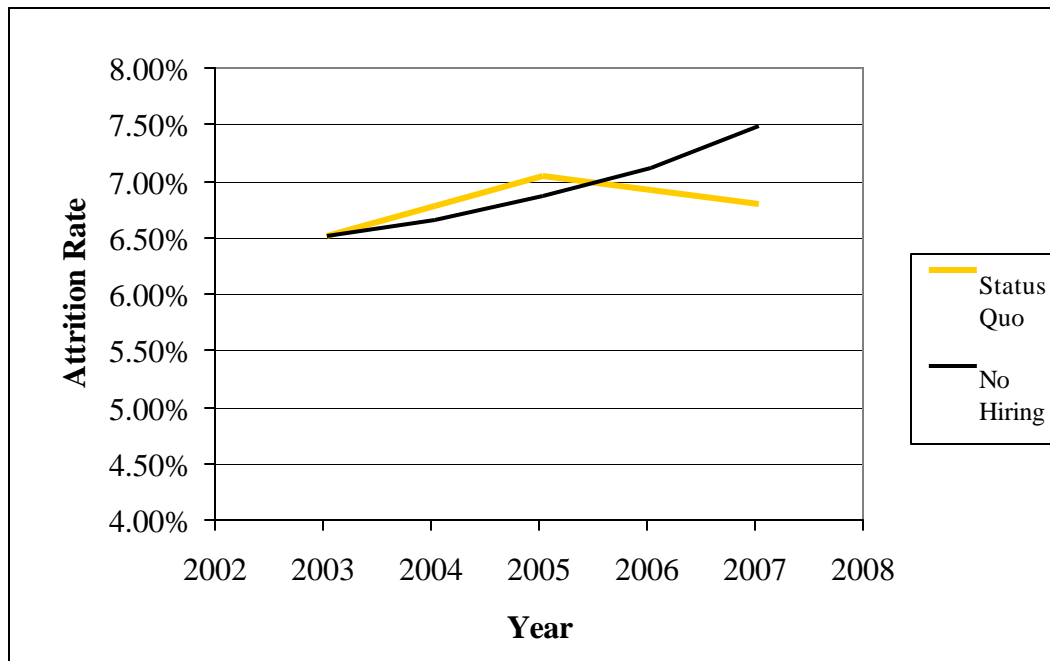


Figure 6 - Forecasted Revenue Officer Attrition Rates for the "No Hiring" and the "Status Quo" Scenarios

Conclusions and Direction for Further Research

The model developed here not only provides a tool to forecast staffing levels, it provides some insight into the tenure decision of workers within the IRS.

First, we don't see a mass exodus once employees become eligible for retirement. Rather, only a fraction of retirement eligible RAs and ROs leave the IRS each year. In addition, Revenue Agents appear to have more incentive to continue working. It would be interesting to explore to what degree this decision is being driven by financial issues versus job satisfaction issues.

Second, the difference in retirement plans does affect tenure decisions, but only to a point. The results suggest that there is not a significant difference in attrition between CSRS and FERS employees who are not eligible for any form of retirement. One interpretation of this result is that portable retirement funds are not making IRS compliance staff more mobile. However, the model did show FERS employees are more likely to leave when they are eligible for early retirement or if they have reached the top of their salary scale. In addition, CSRS retirement eligible employees are more likely to leave when they have reached the top of their salary scale. Since CSRS pension payments are related to the highest 3 years of pay, retirement eligible employees who can receive a pay increase have more incentive to delay retirement.

Revenue Agent and Revenue Officer attrition rates for current employees are forecasted to increase over the next five years. We forecast that by 2008, 24.3% of the current RA staff and 29.7% of the current RO staff will no longer be employed as a RA or a RO. We also found that ROs are more likely to leave their job than RAs, especially in the first years of employment. Thus, as the IRS increases hiring to replace ROs, there will be noticeable increases in attrition rates. For new hires, attrition for RAs is more evenly spread out in the initial years of employment.

This research could be expanded in several ways. Differentiating employees who make internal job changes from those who leave the service could provide forecasts that are more useful. Some variables, like performance evaluations, may have qualitatively different impacts on internal promotion than on quits. Also, including measures of wages would improve the forecast and would provide the ability to forecast attrition with various proposed pay raises. However, more data would be needed to estimate the wage effects with any degree of confidence. Additional years of data, especially with new hires, would also give more confidence about attrition in the early years of employment.

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Note

The views expressed in this article represent the opinions and conclusions of the authors. They do not necessarily represent the opinion of the Internal Revenue Service.

Appendix

Table A1 - Attrition Model Parameter Estimates

| | Revenue Agents | | | Revenue Officers | |
|--------------------------------|----------------|----------|---|------------------|------------|
| | Standard | | | Standard | |
| | Estimate | Error | | Estimate | Error |
| Intercept | -0.5019 | 0.096 | * | -0.5681 | 0.1396 * |
| Southern US | 0.1027 | 0.0301 | * | 0.0971 | 0.0378 * |
| Western US | 0.00523 | 0.0277 | | -0.0223 | 0.0358 |
| North Central US | -0.0884 | 0.0286 | * | -0.0832 | 0.0406 * |
| Eastern US | -0.149 | 0.0277 | * | -0.1345 | 0.0384 * |
| Washington DC Area | 0.2008 | 0.0382 | * | 0.2682 | 0.0514 * |
| Bargaining Unit | -0.4049 | 0.0258 | * | -0.5019 | 0.0321 * |
| Part-Time | 0.0345 | 0.0527 | | 0.1766 | 0.1058 |
| Under 2 Years of Tenure | -0.00572 | 0.071 | | 0.3746 | 0.1114 * |
| Tenure | -0.0483 | 0.00513 | * | -0.0353 | 0.00878 * |
| Tenure Sq. | 0.00082 | 0.00011 | * | 0.00061 | 0.000187 * |
| Age (minus 21) | -0.0236 | 0.00496 | * | -0.0208 | 0.00781 * |
| Age (minus 21) Sq. | 0.0003 | 0.000091 | * | 0.00026 | 0.000147 |
| Veteran | -0.00525 | 0.0197 | | 0.0631 | 0.0244 * |
| Perf. Eval. Outstanding | -0.0254 | 0.0222 | | -0.0323 | 0.0278 |
| Perf. Eval. Poor | 0.7165 | 0.0799 | * | 0.7143 | 0.0764 * |

| | | | | | |
|------------------------------------|---------|--------|---|----------|----------|
| Bachelor's Degree | -0.1422 | 0.0234 | * | -0.00844 | 0.0249 |
| Advanced Degree | -0.0755 | 0.0357 | * | 0.0142 | 0.0486 |
| Year 1998 | 0.0674 | 0.0298 | * | 0.0789 | 0.0398 * |
| Year 1999 | 0.0902 | 0.0296 | * | 0.0971 | 0.0394 * |
| Year 2000 | 0.3895 | 0.0272 | * | 0.3822 | 0.0371 * |
| Year 2001 | 0.1141 | 0.0288 | * | 0.1289 | 0.0385 * |
| Received No Cash Award | 0.0873 | 0.0206 | * | 0.2006 | 0.0304 * |
| Manager (Eligible) | -0.2662 | 0.0725 | * | -0.1788 | 0.1221 |
| Health Plan (Enrolled) | -0.0929 | 0.0254 | * | -0.1092 | 0.0322 * |
| Medical Disability | 0.1015 | 0.0495 | * | 0.1164 | 0.0592 * |
| FERS Early Eligible | 0.2167 | 0.0479 | * | 0.0601 | 0.0667 |
| FERS Step 10 (not Eligible) | 0.1959 | 0.0646 | * | 0.1542 | 0.0876 * |
| CSRS at Step 10 (Eligible) | 0.1504 | 0.036 | * | 0.0283 | 0.0556 |
| Hoarding Annual Leave | 1.5419 | 0.0699 | * | 1.26 | 0.1017 * |
| Sick Leave User | 0.2289 | 0.0213 | * | 0.2203 | 0.0277 * |
| Family (Part. Proxy) | -0.012 | 0.0195 | | -0.046 | 0.0249 |
| Retire Eligible | 1.0424 | 0.0363 | * | 1.0446 | 0.0534 * |
| 3rd Year of Ret. Eligible | -0.192 | 0.0488 | * | -0.2076 | 0.0767 * |
| Under FERS | -0.0447 | 0.0308 | | -0.0528 | 0.0407 |
| Race | -0.0325 | 0.021 | | -0.0436 | 0.0255 |
| Promotion/Grade Increase | -0.1922 | 0.0329 | * | -0.2116 | 0.0412 * |
| N | 66,562 | | | 32,294 | |
| Log Likelihood | -14,737 | | | -8,231 | |

* Denotes statistical significance at the 5% level

Table A2 - Descriptive Statistics for Attrition Model Data (1998-2002)

| | Revenue Agents | | Revenue Officers | |
|--------------------------------|----------------|--------------------|------------------|--------------------|
| | Mean | Standard Deviation | Mean | Standard Deviation |
| Intercept | 0.0580 | 0.2337 | 0.0705 | 0.2560 |
| Southern US | 0.1300 | 0.3363 | 0.1558 | 0.3627 |
| Western US | 0.2043 | 0.4032 | 0.2464 | 0.4309 |
| North Central US | 0.2039 | 0.4029 | 0.1631 | 0.3694 |
| Eastern US | 0.2397 | 0.4269 | 0.2130 | 0.4094 |
| Washington DC Area | 0.0527 | 0.2234 | 0.0508 | 0.2197 |
| Bargaining Unit | 0.8805 | 0.3244 | 0.8725 | 0.3336 |
| Part-Time | 0.0293 | 0.1687 | 0.0107 | 0.1030 |
| Under 2 Years of Tenure | 0.0178 | 0.1323 | 0.0121 | 0.1092 |
| Tenure | 19.0786 | 8.4678 | 19.1486 | 7.8056 |
| Tenure Sq. | 435.6948 | 345.3972 | 427.5935 | 316.9315 |
| Age (minus 21) | 26.1725 | 8.3479 | 26.0207 | 7.9220 |

| | | | | |
|------------------------------------|----------|----------|----------|----------|
| Age (minus 21) Sq. | 754.6867 | 443.1375 | 739.8322 | 412.4928 |
| Veteran | 0.2061 | 0.4499 | 0.2160 | 0.4712 |
| Perf. Eval. Outstanding | 0.2280 | 0.4196 | 0.2620 | 0.4397 |
| Perf. Eval. Poor | 0.0054 | 0.0730 | 0.0122 | 0.1099 |
| Bachelor's Degree | 0.7650 | 0.4240 | 0.5093 | 0.4999 |
| Advanced Degree | 0.0842 | 0.2776 | 0.0627 | 0.2424 |
| Year 1998 | 0.2137 | 0.4099 | 0.2189 | 0.4135 |
| Year 1999 | 0.2059 | 0.4044 | 0.2080 | 0.4059 |
| Year 2000 | 0.1981 | 0.3986 | 0.1969 | 0.3977 |
| Year 2001 | 0.1913 | 0.3933 | 0.1941 | 0.3955 |
| Received No Cash Award | 0.2021 | 0.4016 | 0.1365 | 0.3433 |
| Manager (Eligible) | 0.0082 | 0.0904 | 0.0045 | 0.0669 |
| Health Plan (Enrolled) | 0.8613 | 0.3456 | 0.8558 | 0.3513 |
| Medical Disability | 0.0256 | 0.1579 | 0.0329 | 0.1783 |
| FERS Early Eligible | 0.0455 | 0.2084 | 0.0477 | 0.2132 |
| FERS Step 10 (not Eligible) | 0.0155 | 0.1237 | 0.0177 | 0.1318 |
| CSRS at Step 10 (Eligible) | 0.0526 | 0.2232 | 0.0420 | 0.2005 |
| Hoarding Annual Leave | 0.0057 | 0.0753 | 0.0055 | 0.0740 |
| Sick Leave User | 0.1821 | 0.3859 | 0.2192 | 0.4137 |
| Family (Part. Proxy) | 0.2845 | 0.4512 | 0.3498 | 0.4769 |
| Retire Eligible | 0.1368 | 0.3436 | 0.1040 | 0.3053 |
| 3rd Year of Ret. Eligible | 0.0190 | 0.1367 | 0.0140 | 0.1173 |
| Under FERS | 0.5055 | 0.5000 | 0.4627 | 0.4986 |
| Race | 0.2409 | 0.4276 | 0.3349 | 0.4719 |
| Promotion/Grade Increase | 0.0961 | 0.2948 | 0.1072 | 0.3094 |
| N | 66,562 | | 32,294 | |

ⁱ See Figure 1

ⁱⁱ For examples see Topel (1991), Koch and Ragan (1986), Light and Ureta, (1992), Rees (1991), and Wolpin (1992).